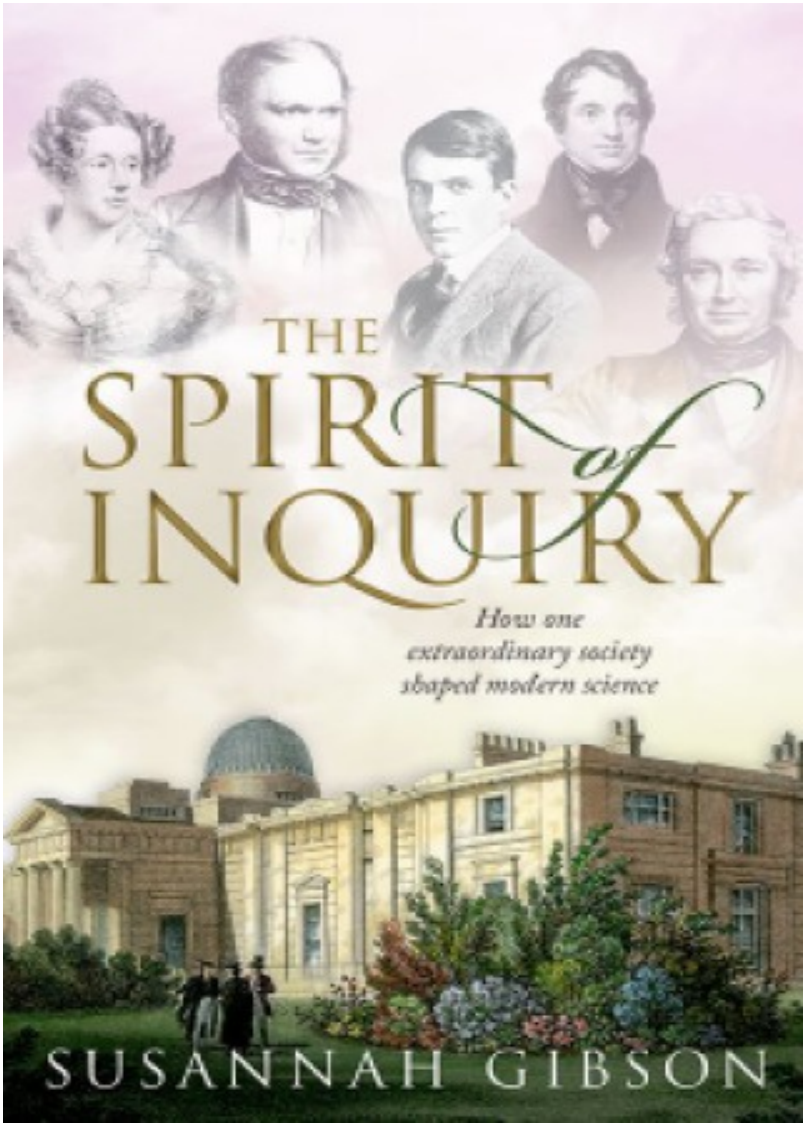
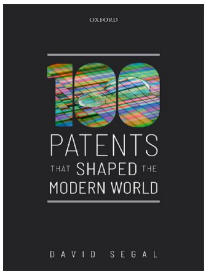
The Spirit of Inquiry : How One Extraordinary Society Shaped Modern Science 1st Ed. Edition Susannah Gibson pdf download

https://ebookmass.com/product/the-spirit-of-inquiry-how-one-extraordinary-society-shaped-modern-science-1st-ed-edition-susannah-gibson/



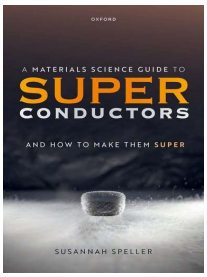
One Hundred Patents That Shaped The Modern World 1st Edition David Segal

https://ebookmass.com/product/one-hundred-patents-that-shaped-the-modern-world-1st-edition-david-segal/



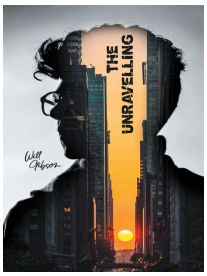
A Materials Science Guide to Superconductors: and How to Make Them Super Susannah Speller

https://ebookmass.com/product/a-materials-science-guide-to-superconductors-and-how-to-make-them-super-susannah-speller/



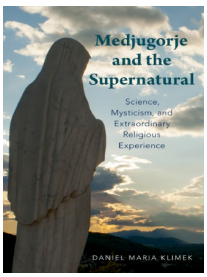
The Unravelling 1st Edition Will Gibson

https://ebookmass.com/product/the-unravelling-1st-edition-will-gibson/



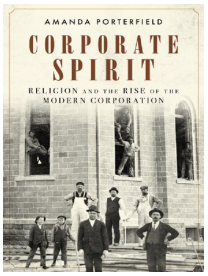
Medjugorje and the supernatural : science, mysticism, and extraordinary religious experience Klimek

https://ebookmass.com/product/medjugorje-and-the-supernatural-science-mysticism-and-extraordinary-religious-experience-klimek/



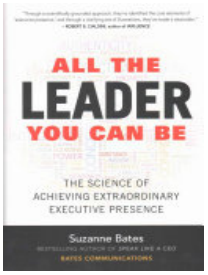
Corporate spirit: religion and the rise of the modern corporation Amanda Porterfield

https://ebookmass.com/product/corporate-spirit-religion-and-the-rise-of-the-modern-corporation-amanda-porterfield/



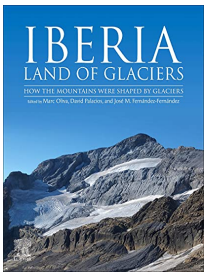
All the Leader You Can Be: The Science of Achieving Extraordinary Executive Presence 1st Edition Suzanne Bates

https://ebookmass.com/product/all-the-leader-you-can-be-the-science-of-achieving-extraordinary-executive-presence-1st-edition-suzanne-bates/



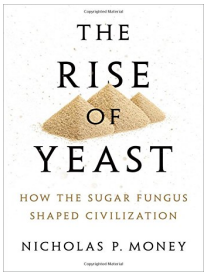
Iberia, Land of Glaciers: How The Mountains Were Shaped By Glaciers 1st Edition Marc Oliva (Editor)

https://ebookmass.com/product/iberia-land-of-glaciers-how-the-mountains-were-shaped-by-glaciers-1st-edition-marc-oliva-editor/



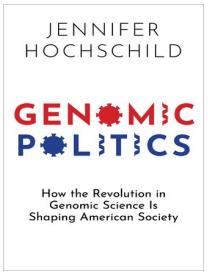
The Rise of Yeast: How the sugar fungus shaped civilisation Nicholas P. Money

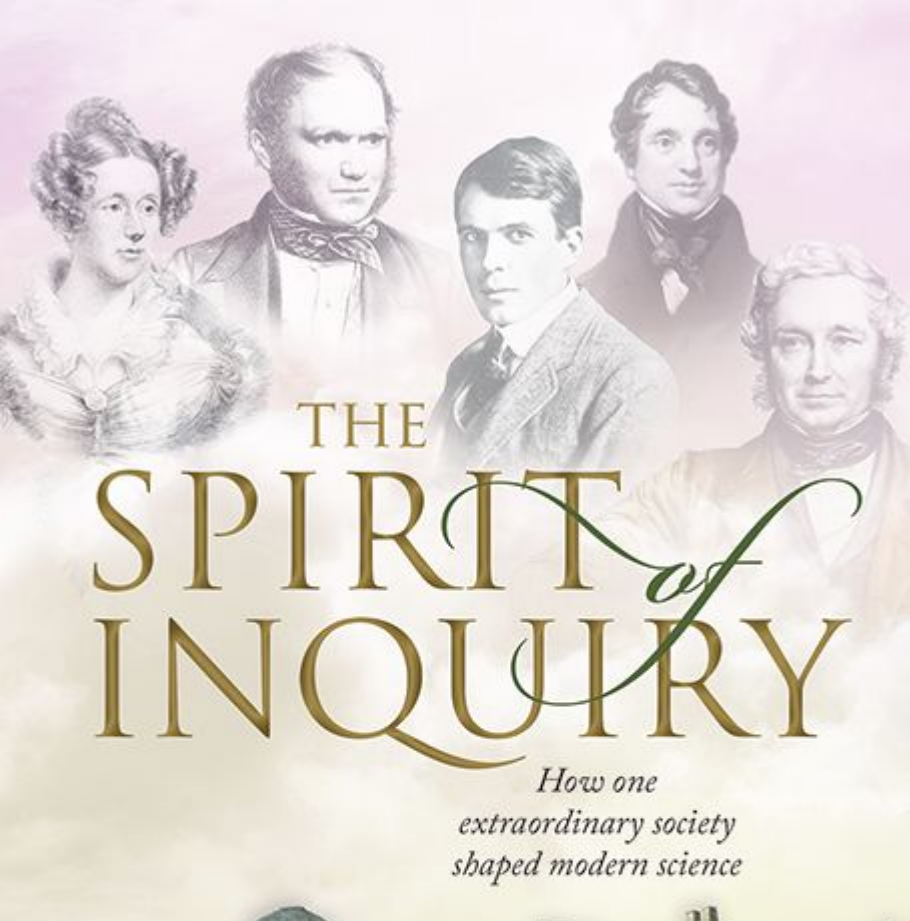
https://ebookmass.com/product/the-rise-of-yeast-how-the-sugar-fungus-shaped-civilisation-nicholas-p-money/



Genomic Politics: How the Revolution in Genomic Science Is Shaping American Society Jennifer Hochschild

https://ebookmass.com/product/genomic-politics-how-the-revolution-in-genomic-science-is-shaping-american-society-jennifer-hochschild/





THE SPIRIT of INQUIRY

How one extraordinary society shaped modern science

SUSANNAH GIBSON

THE SPIRIT OF INQUIRY

THE SPIRIT of INQUIRY

How one extraordinary society shaped modern science

SUSANNAH GIBSON

With a Foreword by Simon Conway Morris FRS

OXFORD
UNIVERSITY PRESS

OXFORD
UNIVERSITY PRESS

Great Clarendon Street, Oxford, OX2 6DP,
United Kingdom

Oxford University Press is a department of the University of Oxford.
It furthers the University's objective of excellence in research, scholarship,
and education by publishing worldwide. Oxford is a registered trade mark of
Oxford University Press in the UK and in certain other countries

First Edition published in 2019

Impression: 1

Published in the United States of America by Oxford University Press
198 Madison Avenue, New York, NY 10016, United States of America

British Library Cataloguing in Publication Data

Data available

Library of Congress Control Number: 2018951266

ISBN 978–0–19–883337–6

Printed in Great Britain by
Clays Ltd, Elcograf S.p.A.

To SLDF

CONTENTS

a glorious Phantom may
Burst, to illumine our tempestuous day.

England in 1819
Percy Bysshe Shelley

ACKNOWLEDGEMENTS

I would like to thank the Cambridge Philosophical Society for being so generous with their resources and time, especially for making their archives so readily accessible and for allowing me access to their (many and varied) publications and private papers. The Society's council, its fellows, and its staff have been unfailingly helpful; thanks especially to Jim Woodhouse, Simon Conway Morris, Alan Blackwell, Beverley Larner, Janet Hujon, Sara Lees, and Wendy Cattell. Jim Secord, as always, has been a stalwart advisor and tireless reader of early drafts.

This book would not have been possible without the work of Joan Bullock-Anderson, who catalogued the Society's archive in 2014, nor without the support of the Whipple Library and its wonderful staff—Anna Jones, Dawn Moutrey, Agnieszka Lanucha, and Jack Dixon—where that archive currently resides. Yvonne Nobis and the staff of the Betty and Gordon Moore Library, Sandra Freshney of the Sedgwick Museum archives, and the staff of Cambridge University Library's Rare Books Room have also been extremely helpful.

Thanks to the many people who spoke to me of their experiences of the Society over the years, particularly the Henslow fellows (and especially Alex Liu and Emily Mitchell), the former executive secretary Judith Winton Thomas, and many former editors of the Society's journals, as well as former members of the Council.

Thanks to the following for sharing their expertise: Boris Jardine, Josh Nall, Stephen Courtney, Jack Tavener, and the anonymous reviewer; Catherine Clarke, for her early advice on the manuscript; and Ed Potten, for asking many pertinent questions over the last two years.

At Oxford University Press, I would like to thank Latha Menon and Jenny Nugee for their hard work, and also Rosanna van den Bogaerde,

Jonathan Rowley, Caroline Quinnell, and all involved in the book's production.

I am grateful to Girton College (who continue to lead the way on social innovation). But, most of all, I am grateful to my family— especially Seb, Amos, Ridley, and Oisín (my constant companion through much of the writing of this manuscript).

FOREWORD

by Simon Conway Morris

There is much to be said for the understated, not least in the coinage of self-depreciation and getting things done without undue fuss. Such is the hallmark of the Cambridge Philosophical Society, whose history has remained largely, indeed unjustly, neglected. Now, thanks to the forensic skills of Susannah Gibson, the Society is placed in a remarkable new light, as both witness and participant in those momentous events that revealed entirely new worlds, those of organic evolution, deep time, and fundamental physics. So much is apparent from the Society's early days, when reports were received from Charles Darwin on his world-changing voyage, George Biddell Airy lectured on subjects as disparate as eye defects and pendulums, James Clerk Maxwell first addressed the Society at the age of twenty-two, J.J. Thomson spoke on the still mysterious cathode rays, and, to a packed house, Arthur Eddington outlined the sensational confirmation of Einstein's theories of space-time as the result of observations of how starlight was seen to be bent during a solar eclipse. This interval of little more than a century led to profound changes in our perspective. But it also opened some terrible possibilities. So it was that, as war spread across Europe, Rudolph Peierls, publishing in the Society's *Proceedings*, presented calculations that, with further refinement, led to the inexorable conclusion that a mass of enriched uranium smaller than a tennis ball could, in principle, annihilate a city.

From its establishment in 1819, the inspiration of its founders, John Stevens Henslow and Adam Sedgwick (along with Edward Daniel Clarke), was reflected in the Society, which was driven by a deep curiosity as to why the world is as it is, and how, with such knowledge, it might then be improved. With hindsight, this path to our modern world, where astounding discoveries are almost commonplace, reads as simple narrative—but

it was not so. Susannah is adept at showing how intricate and braided the actual story was, and, as importantly, how the situation both in the University of Cambridge and across the country was, on occasion, very far from propitious.

Near the end of her book, Susannah remarks how the 'Society has [now] become just a small part of the vast landscape of Cambridge science—and that is the true mark of its success'; this is high praise indeed. Success, as is so often the case with English enterprises, lies in the genius of reinvention. In the case of the Society, it was sometimes involuntary. In the 1860s, looming financial catastrophe, largely the result of the egregious Mr Crouch, compelled a migration from its original home to a site that fortuitously made the Society a neighbour of the new Cavendish Laboratory. Here, as was repeatedly the case during its two-hundred-year history, the Society served as a vital catalyst in the epic developments of Cambridge science.

Susannah's account reveals science as not only exhilarating but dotted with events and characters. Think of the crowds watching co-founder Clarke launching a hot-air balloon from Jesus College, as well as his arranging volcanic eruptions in his packed lectures. And what about Michael Foster's distillation of noisome 'excrementitious fluids' in his laboratory that, strange to report, won him valuable bench space at the expense of his then neighbour, the Plumian Professor of Astronomy? In the wider field, the Society also repeatedly gained territory for the advancement of Cambridge science. Thus, it helped to win space for a new University Botanic Garden, provided the seedcorn for the now immense collections devoted to natural history, and, as importantly, provided the nucleus for the world's finest scientific library (where, until its shameful closure, I spent endless hours pursuing my own research into evolution). So too, while the mantle of experimental expertise necessarily passed to the University departments, the Society pioneered the study of anthropometrics, thereby laying the groundwork for statistical rigour in biology.

Nor has the Society rested on its laurels. Recently, it inaugurated a scheme of Henslow Fellowships for gifted young scientists, and Susannah

mentions the ongoing contributions of one recent and one current Fellow, Alex Liu and Emily Mitchell, in their studies of the dawn of animal life. So, the Society looks forward with confidence, but so too it looks back at its own initiation in 1819 as a turning point in Cambridge science. It may be a cliché that all scientists stand on the shoulders of giants (though less often is it remembered that this conceit goes back to at least the time of Bernard of Chartres), but it is no accident that the official seal of the Society is in the form of Roubiliac's celebrated statue of Isaac Newton. Located in the antechapel of Trinity College, this foundation (where a memorial to Adam Sedgwick is also to be found) as well as my own College of St John's (once home to John Henslow) played their own parts in the nurturing of the Society. Here, we join Susannah in saluting a remarkable institution which did, indeed, play its small part in the making of Cambridge science, but played it very well.

SIMON CONWAY MORRIS, FRS
President of the Cambridge Philosophical Society (2018–2019)

PREFACE

The Antikythera mechanism is one of the most extraordinary objects to survive from the world of ancient Greece. On this smallish fragment of metal, heavily corroded from centuries spent beneath the waves, the shape of a cross enclosed within a circle immediately catches the eye. It is clearly the work of a skilled craftsman; but what is it? It has been an object of fascination since its discovery in 1902, and modern scientific testing, using x-ray tomography and high-resolution surface scanning, have confirmed a long-held suspicion that the circles that appear over and over again in the body of the object were once an intricate system of gear wheels. There were more than thirty of these precisely cut brass wheels, and they were used to model the motions of the heavens. Whoever made this extraordinary device must have had a detailed knowledge of the movements of the celestial bodies, as well as astounding technical skill: the sophistication of the Antikythera mechanism was not matched for many centuries, when the first mechanical astronomical clocks were developed in China, and it was many more centuries before the technology reappeared in Europe.

The first meeting I ever attended of the Cambridge Philosophical Society was about this ancient machine. A packed lecture hall hung on every word of Mike Edmunds, Emeritus Professor of Astrophysics at the University of Cardiff, as he revealed the secrets of the device to us. His talk wove together archaeology, materials science, history, and cosmology. The Antikythera mechanism fundamentally changes the way we understand ancient technology; it can give us insights into the workshop of the Greek craftsman and into the mind of the Greek astronomer. Edmunds's study of it not only makes use of cutting-edge analytical techniques; it also provides an ideal example for explaining those techniques to a lay

audience. It is, in short, the perfect topic for discussion at a meeting of a philosophical society.

But what exactly is a philosophical society? Should an audience member be surprised to hear about metallurgical imaging techniques rather than Plato's idealism or Kant's metaphysics? It has long been a refrain amongst the Society's staff when talking to prospective members that 'the Society is not involved in philosophy, but in natural philosophy, which is to say science'. That is a neat summation of a series of complex terms which have had multiple different meanings throughout history; perhaps too neat?

The phrase 'natural philosophy' has ancient roots. It is often associated with Aristotle and his holistic study of the natural world. But, as the centuries wore on and Aristotle's work was reimagined in line with new Christian doctrines, natural philosophy grew into something else: a way of understanding the natural world as it was created by God. The subjects studied by natural philosophers were incredibly varied and included the sciences of motion and mechanics, the properties and qualities of matter, the art of astronomy, and more esoteric notions such as change, chance, and causes.[1]

By the late seventeenth century, natural philosophy was evolving again. That is when Isaac Newton, working in Cambridge, published his most famous book— *Philosophiæ naturalis principia mathematica*, or, *The mathematical principles of natural philosophy*. This book did something quite unexpected: it merged abstract philosophical study with the precision of mathematics. For Newton, natural philosophy was still essentially a religious activity, one complementary to his strongly held views on theology, but the union of philosophy and mathematics would have a profound effect on the field. It made individual sciences such as astronomy broaden out, because now they did not simply deal with mathematical calculations, but were permitted to seek out the underlying causes of the phenomena they addressed; and it allowed philosophical arts such as studies of motion to become more precise as they turned from qualitative to quantitative.[2]

Some people speak of this period at the end of the seventeenth century as a 'scientific revolution', the point at which natural philosophy ceased and modern science began. But, in reality, natural philosophy lived on for many years. In the eighteenth century—the century of Enlightenment—natural philosophy remained a broad art. More than that, it began to draw in a broader spectrum of participants. The Enlightenment ideal of egalitarianism meant that ordinary people were being exposed to aspects of culture (be they artistic or scientific) that would previously have been closed to them. The seventeenth century had seen the creation of a new entity for the elites—the scientific society—and now, in the eighteenth century, there was growing demand for similar societies to cater to the general populace. In London, the Royal Society (founded in 1660) had been the centre of elite natural philosophy for over a hundred years but, from the late eighteenth century, two new kinds of organization began to grow up. First, based in London, were the specialist scientific institutions, which catered for single subjects like natural history, geology, and astronomy. Then there were the provincial societies.

These provincial societies, usually based in industrial towns such as Manchester, or fashionable spa towns such as Bath, often styled themselves as 'literary and philosophical', reflecting the societies' intention to introduce their members to a wide span of knowledge across the arts and sciences. But that was not all the societies did—the original concept of natural philosophy as a sort of spiritual or moral experience was as relevant as ever: for example, the founders of the Literary and Philosophical Society in the northern town of Halifax, a centre of wool manufacture, hoped that they would encourage 'a taste for scientific and other liberal pursuits, which may serve to elevate the intellectual and moral character, and thus to promote . . . the best interests of mankind'.[3] The societies were an instant hit and audiences flocked to their grand new lecture halls to hear about all the marvels of the era: electricity and steam power; the powerful new machines of the industrial age; advances in medicine; and explorations of new lands; but also about poetry, music, and fine paintings. Membership of the provincial societies grew rapidly and,

Exploring the Variety of Random Documents with Different Content

principal subject is the birth of Amphitrite, who is surrounded by Tritons and dolphins.”

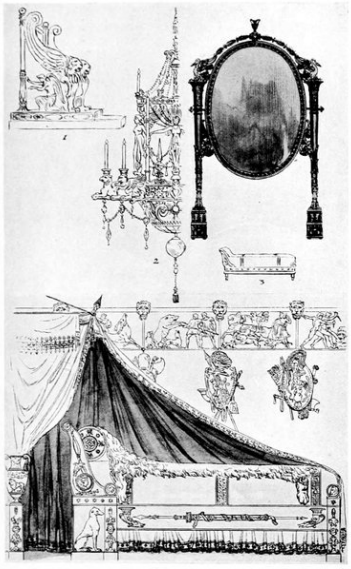


PLATE LXVI

The cornice and lambrequin are unknown to the Directoire period; a pole ending in an arrow, or thyrsus, supports two curtains of calico, or silk. These curtains are relieved by a Greek border. The Empire taste demands a little more. Satins and velvets are added to the above. The drapery becomes very ample and beneath them are thin muslin curtains embroidered in dots, stars and squares. Sometimes two rods are used at each window to support the inner and outer curtains. A very fashionable method of furnishing the window was to have two curtains of silk and two of muslin. Decorative borders were used for these. The cornice is restored, and consists of the palm, the thyrsus, a bow, or a laurel wreath in gilded bronze, or painted wood. The colours of these draperies are limited. There are but five strong hues—crimson, green, blue, yellow and white—and there are no shades of these.

There was a tendency for patterns to become smaller; damask was ornamented with little figures, or stripes; Gobelin tapestries were

supplanted by designs in *grisaille* on a red, blue, or green background. These many printed stuffs had pictures derived from Greek, Egyptian, or Roman subjects, or mythology, and appeared as if printed on paper.

The bed used during the Directoire was larger than the Louis XVI. bed.

Generally speaking, the beds were low; and were furnished with one or two mattresses. Some of them had head and footboards of equal height; others had only one headboard. During the Empire, the beds, most frequently of mahogany, were ornamented with gilded bronze trimmings. The frames were also painted with decorations painted in bronze effects. Some of the beds were rounded, or scrolled at the ends, some had *pans à bateau* and some had pilasters supporting vases, busts and even statuettes. The curtain was used. For some styles of beds, the curtains were cast negligently over an arrow. Beds were also made in forms appropriate to the calling of their owners. Some of the shapes seem to have been inspired by the models of Du Cerceau and Bérain in the days of Louis XIV.; for instance, the boat and shell. In 1792, we hear of a bed shaped like a shell, with blue and white curtains. Lafayette had a bed like this.

The beds often had ends of heavy scrolls and most of them had the headboard and footboard of equal height. The round bolster appears at each end, or a cushion that follows the form of the scroll, as shown in the full drawing on Plate LXVIII. The canopy was frequently in the shape of a crown, and from it hung the curtains. The heavy curtain was not unfrequently accompanied with a thin diaphanous curtain that was formally draped.

The dining-room is decorated in stucco, or painted in imitation of marble. The furniture is mahogany. The chairs are covered with leather. The window-curtains are of “Persian” taffeta, cloth or cotton, trimmed with ball fringe. The dining-table is round or oval, and is often supported on the pillar-and-claw.

The dining-room table also is round, and stands on four feet decorated with lions' heads or chimæras; or again it is supported by the pillar-and-claw. The drawing-room table is frequently finished with a marble top, or it is covered with a cloth. Upon it stands a lamp with its shade.

A very ornate tea-table of porcelain brightened with gold and bronze appears on Plate LXV. Above it is shown the decorative top. This is by Percier and Fontaine. No. 6, on the same plate is another table; No. 7 is a tea-table; and No. 5 is another table. All of these are by Percier and Fontaine. Another kind of table designed by Percier was the *table à fleurs*, or *jardinière*. Some of his models, which were made by Jacob Desmalters, are quite ornate. One of these is in the shape of a vase, supported by sphinxes, and filled with growing plants. Upon this stands another basin for growing flowers, or gold-fish, and above this again is a decorative figure. Another design is a round basin or vase for flowers supported by columns, on either side of which are smaller vases.

The console was a large square table decorated with sphinxes, or other ornaments in gilded bronze. Often a mirror was placed at the back framed by the legs.

The commode, like all the rest of the furniture, became more rigid in form and decoration. It was made of walnut or mahogany; and during the Directoire few were supplied with metal ornaments. Indeed, many of them had neither rings nor handles on the drawers. The form of the commode became still heavier during the Empire; but it was enlivened by ornate metal trimmings. A richly decorated commode by Percier and Fontaine appears as No. 2 on Plate LXVII. The *chiffonnière*, which had come into fashion during the last years of the Louis XVI. period, increased in popularity. It was generally a lady's article containing drawers for writing and needlework. The marble top was often surrounded by a railing or gallery.

During the Empire, a set of drawing-room furniture consisted of one or two sofas, six arm-chairs, six chairs, two *bergères* and two *tabourets*. The sofas were placed on either side of the chimney-

piece. One of the favourite varieties of the sofa was the *canapé pommier*, introduced during the Directoire. Its back was square and quite low, and was extended around the sides to take the place of arms. Sometimes the seat was garnished with fringe, and sometimes the wood was left plain.

The many varieties of the draped sofa disappeared. The Directoire and the Empire demanded that the forms of the settee, sofa, and *chaise longue* should be severe to accord with the arm-chairs. The back of the sofa was stuffed, but not the sides or wings. At each end was placed a feather pillow covered with the same material as the sofa. The most popular sofa had a square back that was carried around the seat, forming wings at each side instead of the elbow or arm. The new sofas were called *Méridienne* and *canapé pommier*. Tapestry, figured satin, worsted damask or printed cloth, put on with braid, were used for coverings. At the end of the Empire period, the divan was introduced. This seat was suggested by the Eastern travellers.

The *banquette* was covered with velvet trimmed with gold or silk braid and fringe. The most fashionable *chaise longue* was of the kind upon which Madame Récamier is lounging in David's celebrated portrait. Both ends of this piece were alike. One end of a similar piece of furniture appears as No. 2 on Plate LXV. The *bergère en gondole* was also popular. Its back was lower and more rounded than that of the *bergère* on Plate XLVIII., No. 3. Gondola-shaped chairs and bar-backed chairs and the heavy scrolled arm-chair were the favourites, also the double arm-chair.

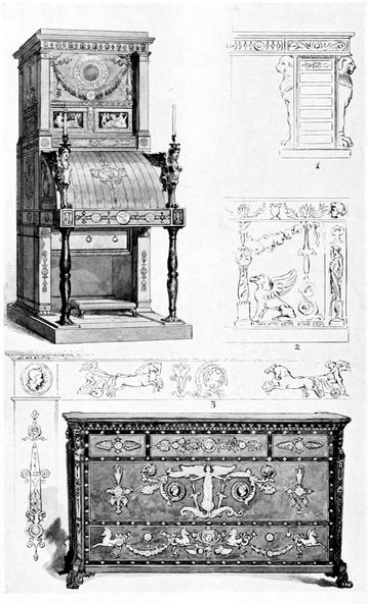


PLATE LXVII

The framework of chairs was generally mahogany, or painted and bronzed, and, for very rich homes, gilded wood. The square form was preferred, especially for the arm-chair, which rarely had cushions. Sometimes the front feet were in the sabre, or glaive shape. The shield shape too was used for the back and was ornamented with military trophies and laurel wreaths. The back and seat were stuffed, and braids and borders framed the cushions. The material used for covering was generally of a solid colour with a design printed on it. Silk velvet, damask, or satin was used. The design was often golden yellow. Sometimes back and seat were sprinkled with rosettes or stars. Braids were used to hide the nails. Printed cottons and worsted damasks were also used for cheaper upholstery work. Ball fringe was much used to go around the back.

Desk chairs kept somewhat to the rounded and gondola form. The seats were often a half circle, the feet turned or in the console shape. Sometimes they were even carved in the shape of chimæra or lions whose heads came up to the level of the arms. The back, too, was frequently curved in the shape of a half circle. The top rail was sometimes covered like the seat,—in leather. Some of these

turning up in the centre of the back like a cocked hat gave to them the name *fauteuils Bonaparte*. Mahogany was chiefly used for the frames, though oak and walnut were sometimes employed.

During the Directoire, the legs of the arm-chair were often X-shaped and the arms ended in a lion's head. The open-backed chair was very popular. The one on Plate LXVIII., No. 2, is dated 1793; and Nos. 1, 3, and 5 are of the year 1796. The "Trafalgar" that persisted for so long was a development of No. 1. The chairs No. 1 and 3 on Plate LXV. are by Ch. Normand (b. 1765; d. 1830), who also designed the *chaise longue*, No. 2, on the same plate. Normand's earlier work bridges the gulf between the styles Louis XVI. and the Empire.

---

26. *Journal de la Mode*, 1790.

27. De Goncourt, *La Société Française pendant la Révolution*. Paris, 1854.

THE END

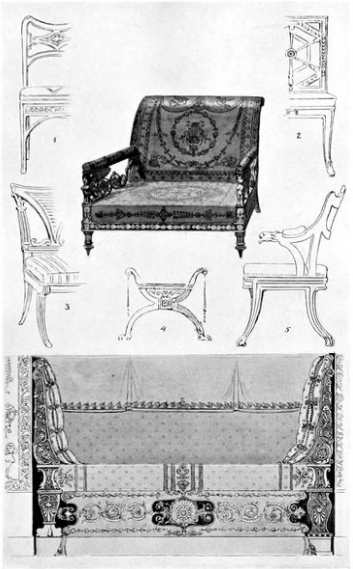
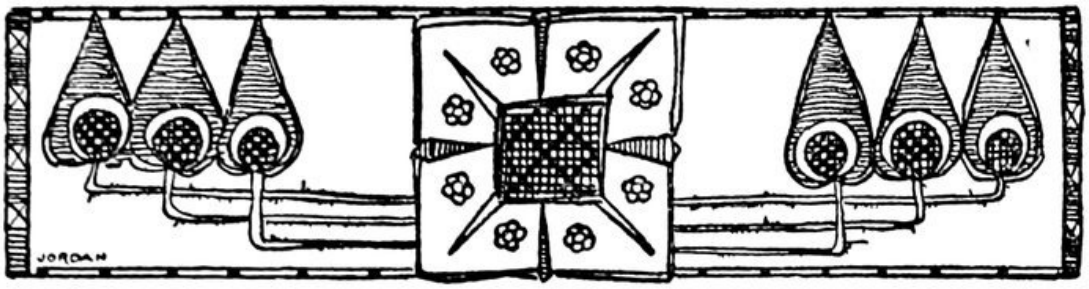


PLATE LXVIII

INDEX



INDEX

A

B

C

Welcome to our website – the perfect destination for book lovers and knowledge seekers. We believe that every book holds a new world, offering opportunities for learning, discovery, and personal growth. That’s why we are dedicated to bringing you a diverse collection of books, ranging from classic literature and specialized publications to self-development guides and children's books.

More than just a book-buying platform, we strive to be a bridge connecting you with timeless cultural and intellectual values. With an elegant, user-friendly interface and a smart search system, you can quickly find the books that best suit your interests. Additionally, our special promotions and home delivery services help you save time and fully enjoy the joy of reading.

Join us on a journey of knowledge exploration, passion nurturing, and personal growth every day!